

REMARKS

In this application, claims 1-37 and 49-66 are pending. Claim 1 is amended to clarify the relationship between the incident angle and the diffraction efficiency, but does not raise any new issues requiring further search. Claims 4-63 are withdrawn. Non-elected claims 38-48 are canceled. Claims 64-66 are new. Support for claims 64-66 can be found at least in FIGs. 4-6 and in the Specification at page 36, line 2 through page 38, line 19.

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,257,131 (“Yoshida”) in view of U.S. Patent No. 5,065,380 (“Yokota”). The rejection is respectfully traversed.

Claim 1, as amended, recites a tilt sensor for determining information related to a tilt of an object to a reference plane, comprising, *inter alia*:

a diffraction element disposed at a position on an optical path of a light beam from the object, the light beam entering the diffraction element at an incident angle, the position of the diffraction element determined in accordance with a positional relation with the object, wherein the diffraction element diffracts diffraction light at a diffraction efficiency that varies in accordance with the incident angle of the light beam.

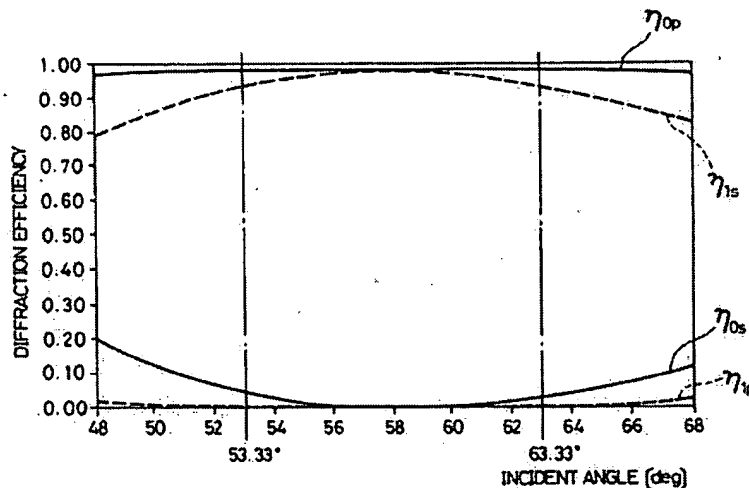
Applicants respectfully submit that Yoshida and Yokota, whether alone or combined, fail to disclose such a limitation.

The Office Action asserts that Yoshida discloses “a diffraction element” that “diffracts diffraction light at a diffraction efficiency that varies as an incident angle of the light beam changes,” as recited in claim 1, in FIG. 9. This interpretation of Yoshida is respectfully traversed.

Yoshida does not disclose a diffraction element where the diffraction efficiency “that varies in accordance with the incident angle of the light beam.” To the contrary, Yoshida describes a diffraction grating used with a light beam having an incident angle “in a specified range (i.e. within a [sic] of 5° of the Bragg angle . . .).” Yoshida, Col. 13, ll. 47-50. As shown in FIG. 9 of Yoshida (reproduced below), the diffraction efficiency is substantially equal in the specified

range of the incident angle. Thus, Yoshida fails to disclose a diffraction element that “diffracts diffraction light at a diffraction efficiency that varies in accordance with the incident angle of the light beam,” as recited in claim 1.

FIG. 9



Yokota fails to remedy the deficiencies of Yoshida. Yokota is cited as disclosing an optical pickup used as a tilt sensor. Far from disclosing “a diffraction element” that “diffracts diffraction light at a diffraction efficiency that varies in accordance with the incident angle of the light beam,” as recited in claim 1, however, Yokota actually teaches away from a tilt sensor having such a diffraction element. Rather, the asserted “tilt sensor” in Yokota uses a diffraction element where the diffraction angle, rather than the diffraction efficiency, varies as the incident angle of the light beam changes. Yokota, FIG. 3(b) and Col. 8, ll. 34-68.

Thus, Yoshida and Yokota, whether alone or combined, fail to disclose all of the elements of claim 1. Claims 2-3 depend from claim 1, and are patentable over Yoshida in view of Yokota for at least the reasons discussed above. Nevertheless, Applicants submit that these claims are patentable over Yoshida in view of Yokota for further reasons.

Claim 3 recites the tilt sensor of claim 1, wherein the diffraction element “is set so that the relation between the intensity of the diffraction light and the incident angle is substantially

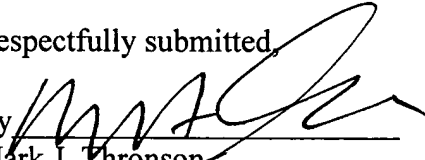
linear on a predetermined range of the incident angle.” The Office Action asserts that this is disclosed by FIG. 9 of Yoshida. This interpretation of Yoshida is respectfully traversed.

As discussed above with regard to claim 1, FIG. 9 of Yoshida, the diffraction efficiency is substantially equal in the specified range of the incident angle. No part of FIG. 9 shows a relation between the intensity of the diffraction light and the incident angle that is “substantially linear,” as recited in claim 3. Yokota fails to remedy the deficiencies of Yoshida, because, as discussed above with regard to claim 1, the diffraction element in Yokota varies the diffraction angle, rather than the diffraction efficiency, in relation to the incident angle of the light beam. Thus, Yoshida and Yokota, whether alone or combined, fail to disclose further elements of claim 3.

Accordingly, Applicants respectfully request that the § 103(a) rejection of claims 1-3 be withdrawn, and the claims be allowed. In view of the above amendment, Applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

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